

METHOD AND APPARATUS FOR
PROVIDING FORCE FEEDBACK
FOR A GRAPHICAL USER INTERFACE

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ABSTRACT OF THE DISCLOSURE

10 A method and apparatus for providing force feedback to a user operating a human/computer interface device in conjunction with a graphical user interface (GUI) displayed by a host computer system. A physical object, such as a joystick or a mouse, controls a graphical object, such as a cursor, within the GUI. The GUI allows the user to interface with operating system functions implemented by the computer system. A signal is output from the host computer to the interface device to apply a force sensation to the physical object using one or more actuators. This desired force sensation is associated with at least one of the graphical objects and operating system
15 functions of the graphical user interface and is determined by a location of the cursor in the GUI with respect to targets that are associated with the graphical objects. The graphical objects include icons, windows, pull-down menus and menu items, scroll bars ("sliders"), and buttons. The force sensation assists the user to select a desired operating system function or physically informs the user of the graphical objects encountered by the cursor within the GUI. A microprocessor local to
20 the interface apparatus and separate from the host computer can be used to control forces on the physical object.